

Healthy Soils, Healthy Farms, Healthy Environment (H-3) Project East Central SCIA Partner Grant - Final Report

Purpose:

The focus of the H-3 Program was to encourage practices that improve the awareness of agronomic soil testing in York, Durham, Haliburton, Peterborough and the Kawartha regions. The project provided:

- support for students to collect soil samples for farmers within the five counties and regions,
- coordination of lab analysis through A&L Canada Laboratories,
- information workshops on how to use the soil test information,
- a means for the collection and analysis of a large number of soil samples to quantify soil sulphur levels under a variety of farm management systems and
- an overview of on-line GIS mapping capabilities through OMAFRA's AgMaps portal.

Background:

The Healthy Soils, Healthy Farms, Healthy Environment (H-3) Program was launched in August 2012. The three year partnership project was developed through an OSCIA Partner grant between East Central Soil and Crop Improvement Association (ECSCIA) and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

The original target for the H3 project was 70 farms participating over the 3 year period (10 farms in year one, 20 farms in year 2 and 40 farms in the third year).

Methods:

1. OMAFRA Environmental Specialist contacted by a local farmer to have soil samples collected from his/her fields through the project (voluntary project at the request of the farmer).
2. Farmer paid for most of the analysis for soil sampling (\$12.00 + \$1.56 HST = 13.56 per sample which will require a cheque payable to "A&L Canada Laboratories Inc."
3. The H-3 project paid for the sulphur and organic matter portion of the test (\$2.70 + HST)
4. Farmer + soil sampler met to discuss fields and location. (When students returned to the office, field maps were prepared showing field names and acreage using AgMaps)
5. Sampling procedure used was based on OMAFRA recommendations for soil sampling found at:
http://www.omafra.gov.on.ca/english/nm/regs/sampro/sampro02_09.htm#1
6. Analysis of samples was provided by A&L Canada Laboratories

7. Farmers were invited to follow-up H-3 workshops to discuss the results in the fall/winter following sampling

Communication Plan:

Presentations and updates on the H-3 project were provided at the four county/region annual meetings in January 2015. In addition, regular updates were provided in ECSCIA newsletters throughout 2014.

Participants were invited to attend educational workshop held December 16th 2014 in Peterborough County and an evening workshop on the same day near Lindsay. The last workshop was held on December 17 2014 in Goodwood, Durham Region.

A new aspect for the December 2014 workshops was that each workshop had a different emphasis with a different featured speaker (Peterborough – fruit and vegetable crop fertility [Christoph Kessel]; Lindsay – pasture and forage crop fertility [Jack Kyle] and Goodwood – corn, soy and wheat crop fertility [Bonnie Ball]). Approximately 65 producers attended the workshops in 2014.

Assessments:

Samples were sent to an OMAFRA accredited lab, A & L Canada Laboratories for analysis. The specific parameters tested for are listed in Table 1. Additional analysis for sulphur, organic matter and zinc testing were performed for the purpose of research for OMAFRA. The farmer was responsible for most of the analytical costs (\$13.56) while the H-3 project covered cost related to sulphur analysis (\$2.60).

Table 1: Nutrient Analysis Package for H3 participants

Phosphorus	Potassium	Magnesium	Calcium
pH	Manganese	Aluminum	Sodium
Organic Matter	Zinc	Sulphur	

Results:

In 2014, 79 farm operations participated in the H-3 project, (total of 135 farms for the 3 years). In 2014, 878 composite samples were submitted to A&L Canada Laboratories for analysis (a total of 1281 samples were submitted to the laboratory over the 3 years).

Average soil test result/concentration for phosphorus (bicarbonate extraction method, also known as Olsen method) for all samples over the 3 year trial was 21 ppm and median value was 14 ppm. Median is the value where half the samples are above this value and half the values are below. Figure 1 shows the frequency of various P values for the samples analyzed as part of the project. Approximately 36% of samples have a value of 10 ppm or less. According to the recommendations in the OMAFRA Agronomy Guide Publication 811, soil test values of 10 ppm or lower would very likely see a positive yield response from additional phosphorus. At the other end of the spectrum, 18% of the fields had soil test P values of greater than 30 ppm. The recommendations

in the Agronomy Guide indicate that the fields with greater than 30 ppm soil P do not require any additional P supplementation.

Potassium (K) results show a similar trend as phosphorus. The average plant available soil K test result for all samples was 84 ppm and the median value was 68 ppm. Figure 2 shows the frequency of various K soil values for the samples analyzed as part of the project. Of the samples analyzed 28% had a plant available K value of 50 ppm or less. In contrast, 24% of samples had a plant available K value of greater than 100 ppm. The recommendations in the Agronomy Guide indicate that soil test values of less than 100 will typically show a positive response to additional K supplementation. The recommendations in the Agronomy Guide indicate that some crops will show a positive response for soil test K values of between 100 and 150 ppm albeit at lower levels of K supplementation compared to fields with soil test results less than 100 ppm K.

The number of farms participating (135 farms) exceeded the original target by a factor of 2 (almost). Additional farms had requested soil sampling at the conclusion of the project but were declined because the student samplers had returned to their studies in the fall of 2014.

Seven workshops were conducted to increase the understanding of soil test reports were organized as part of the project over the three year period with approximately 160 people in attendance at these workshops. Workshops featured an overview of the project, introduction to soil fertility and crop nutrition and crop nutrient budgeting workshop.

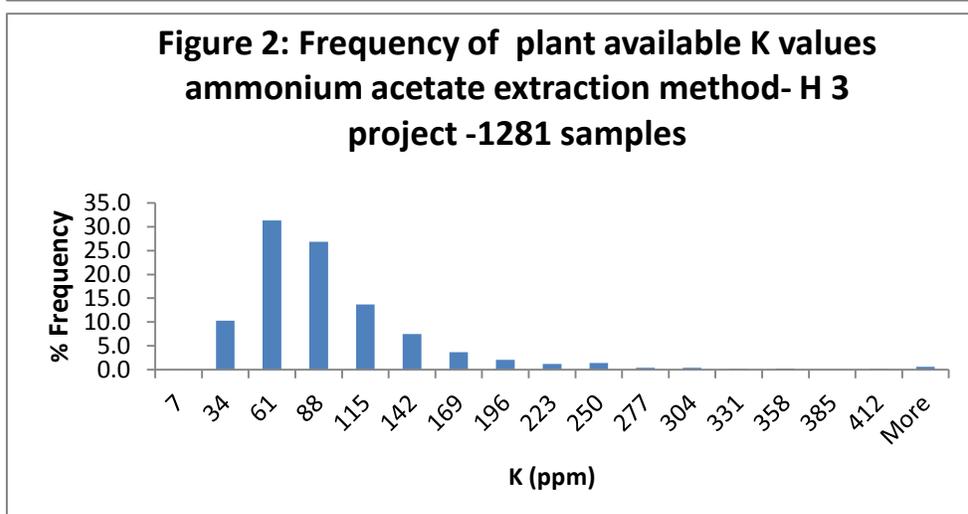
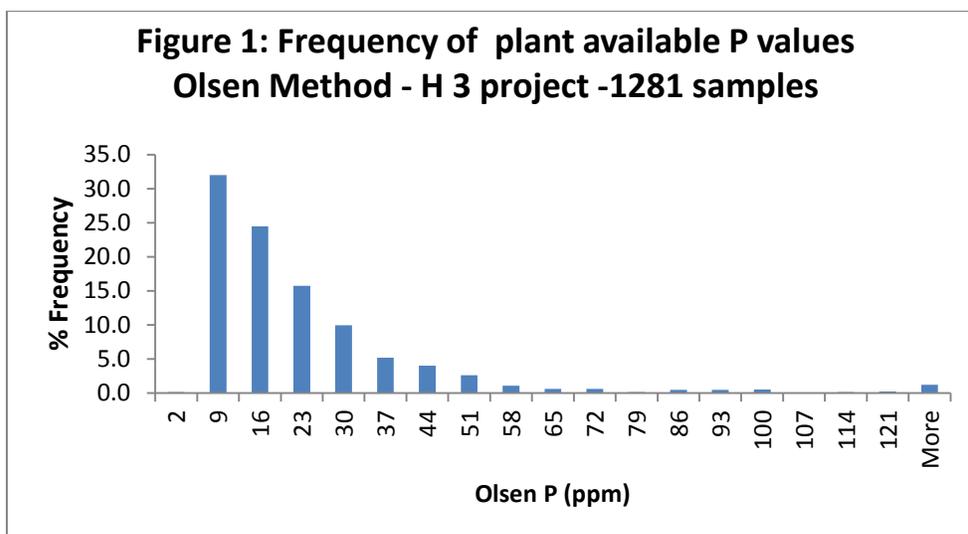
Field maps were prepared by the students as part of the project. The maps were prepared using the OMAFRA AgMaps portal. Maps showed imagery of the farm fields and had labels with field name and acreage provided. AgMaps can be found at www.ontario.ca/agmaps and clicking on "Agricultural Information Atlas Website".

Analysis of the sulphur results is currently underway. Preliminary results indicate that many fields have moderate to low levels and sulphur supplementation may provide a positive yield response, especially for crops such as alfalfa, corn silage and canola on fields that have not had recent manure applications.

Summary:

The high level of response from the farmers in the area is largely from direct contact at local events and peer-to-peer discussions. Numerous farmers commented that soil testing is important but mentioned one or more of the following barriers to soil testing:

- lack of time to collect the samples,
- lack of understanding how to properly collect a composite sample and
- not having access to a soil probe.



Examining the aggregate data from the project indicates that many fields are moderately low to very low for plant available P and K and are likely to show a positive yield response to P and K supplementation. In the context of the 4R Crop Nutrient Stewardship Program being offered by the Canadian Fertilizer Institute and affiliated agri-retail outlets, these results would indicate that the majority of fields sampled have not been subject to over application of nutrients from all sources (right rate) in the last number of years. Opportunities for improvements with respect to the other 3Rs (right source, right place and right time) may exist on some fields.

Information related to sulphur soil test levels through this project and other projects may contribute to future agronomic recommendations for S supplementation for Ontario crops.

Next Steps:

- Project is completed

Acknowledgements:

- Participating farmers
- York, Durham, Peterborough and Victoria/Haliburton Soil & Crop Improvement Associations– for assistance with promotion and communication at their annual meetings and events
- Ontario Soil and Crop Improvement Association – funding support for regional partner grant
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 - Brittany Barkes (year 1)
 - Brittney Wielgos, Amy Tenbult, and Sang-Hun Mun (year 2)
 - Matt Flynn, Tyler DeLay, Charlotte Caza and Margaret Chan (year 3)
- East Central SCIA and Neil Moore – project direction/guidance, communication and administration
- Bonnie Ball, Joel Bagg and Jack Kyle - Agricultural Development Branch, OMAFRA
- A & L Canada Laboratories – support for lab analysis
- OMAFRA Geomatics Unit – support for mapping

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Location of Project Final Report:

Brighton OMAFRA Resource Centre